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EXAMINER

ZHENG, LOIS L

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1742

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09/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/733,807	Applicant(s) MCHUGH ET AL.	
	Examiner Lois Zheng	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-31 is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/25/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1, 4-5, 9-10, 12, 23 and 27 are amended in view of applicant's amendment filed 25 July 2007. Therefore, claims 1-31 are currently under examination.

Terminal Disclaimer

2. The terminal disclaimer filed on 27 July 2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/859,749 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 7-12, 14-15, 16-17, 19 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberlitner et al. WO 01/50505 A2(Oberlitner) in view of Mok et al. US 4,868,575(Mok).

Oberlitner teaches a microelectronic workpiece processing tool comprising the claimed frame, mounting module carrying plurality of workpiece supports, a plurality of wet chemical processing chambers and a track system supporting a transport system(Figs. 1-2, 5-6, pages 13-14) arranged in the claimed fashion. Oberlitner also teaches that each of its wet chemical processing chambers comprises a paddle device

Art Unit: 1742

position approximate to the process location wherein the paddle device moves linearly with respect to the workpiece carried by the workpiece support(pages 17, 23-31, Figs. 12-20).

However, Oberlitner does not explicitly teach that the mounting module having a plurality of positioning elements and attachment elements, the wet chemical processing chamber having a first interface member engaged with one of the positioning elements and a first fastener engaged with one of the attachment elements, the transport system having a second interface member engaged with one of the positioning elements and a second fastener engaged with one of the attachment elements as claimed.

Mok teaches an alignment and assembly mechanism for precisely alignment of two block materials and for securely holding them together. The alignment mechanism comprising a plurality of dowel pins extended from the surface of one block material to be received in a plurality of matching blind holes on the other block material. The holding mechanism comprising matching openings on both block materials adapted to receive bolts and nuts in order to secure two block materials together. See Figs 3-4, col. 4 lines 15-24 of Mok.

Therefore, it would have been obvious to have incorporated the dowel pins as taught by Mok into both sides of the top surface(i.e. deck) of the mounting module and the receiving blind holes as taught by Mok into the wet chemical processing chamber of Oberlitner, or vise versa, in order to ensure precise alignment of the wet chemical process chamber on the mounting module as since Mok teaches utilizing dowel pins and receiving holds for precision alignment. It would also have been obvious to have

Art Unit: 1742

incorporated the nuts and bolts and the holes for receiving them as taught by Mok into both sides of the top surface(i.e. deck) of the mounting module and the wet chemical processing chamber in order to securely position the wet chemical processing chamber on the mounting module.

In addition, it would have been obvious to have incorporated the dowel pins as taught by Mok into the center bottom surface of the mounting module and the receiving blind holes as taught by Mok into the transport tracks supporting the transport system of Oberlitner, or vise versa, in order to ensure precise alignment of the transport system and the center bottom surface of the mounting module. It would also have been obvious to have incorporated the nuts and bolts and the holes for receiving them as taught by Mok into the center bottom surface of the mounting module and the tracks supporting the transport system of Oberlitner in order to securely position the transport system onto center bottom surface of the mounting module.

Regarding claim 1, the dowel pins or their receiving blind holes on both sides of the top surface(i.e. deck) and the center bottom surface of the mounting module of Oberlitner in view of Mok meet the limitation of the claimed positioning elements. The nuts or bolts and their receiving holes on both sides of the top surface(i.e. deck) and the center bottom surface of the mounting module as taught by Oberlitner in view of Mok meet the limitation of the claimed attachment elements.

In addition, the dowel pins or its receiving blind holes of the wet chemical processing chamber as taught by Oberlitner in view of Mok meet the limitation of the claimed first interface member with a first one of the positioning elements. The nuts or

bolts and their receiving holes of the wet chemical processing chamber as taught by Oberlitner in view of Mok meet the limitation of the claimed first fastener.

Furthermore, the dowel pins or its receiving blind holes on the tracks of the transport system as taught by Oberlitner in view of Mok meet the limitation of the claimed second interface member having a second one of the positioning elements. The nuts or bolts and their receiving holes on the tracks of the transport system as taught by Oberlitner in view of Mok meet the limitation of the claimed second fastener.

Since the microelectronic workpiece processing tool as taught by Oberlitner in view of Mok meets all the structure limitation of the instant claim 1, the examiner asserts that the apparatus of Oberlitner in view of Mok is capable of maintaining relative positions between positioning elements such that transport system does not need to be recalibrated when a processing chamber is replaced with another processing chamber as claimed.

With respect to the amended feature of the paddle chamber, the paddle assembly as taught by Oberlitner as shown in Figs. 12-13 and 17 reads on the claimed paddle chamber. The paddle assembly of Oberlitner comprises the claimed opening of receiving a workpiece, the claimed plurality of side walls extending downwardly away from the processing location(Figs. 12-13, Fig. 6 inner walls of the fluid entrance 54 and fluid exit 56). Oberlitner further teaches that the side walls comprises the claimed fluid entrance and the fluid exit both approximate to the process location(Fig. 6, #54, 56). The paddle device of Oberlitner is positioned between the fluid entrance and the fluid

exit as claimed and the paddle device of Oberlitner is movable relative to the workpiece support along a generally linear axis.

Regarding claims 2-3, Oberlitner teaches the claimed deck(Fig. 2 #22) which is the both sides of the top surface of the mounting module where a plurality of processing stations are positioned. Figs 1-2 of Oberlitner further show a short vertical back panel attach to the deck surface on the outside of the mounting module. Therefore, this vertical back panel reads on the claimed rigid outer member/first panel. The vertical walls between the deck surface and the center bottom transport system supporting surface of the mounting modules as taught by Oberlitner in view of Mok read on the claimed rigid interior member/second panel. The deck surface as taught by Oberlitner in view of Mok reads on the claimed bracing member. Even though Oberlitner does not explicitly teach the claimed positioning and attachment elements on the rigid outer member, one of ordinary skill in the art would have found it obvious to have incorporated the dowel pins, the corresponding receiving blind holes, the nuts and bolts, and their corresponding receiving holes as taught by Mok onto the outer rigid member deck as taught by Oberlitner for the same reasons as discussed above.

Regarding claim 7, Oberlitner teaches a plurality of wet chemical processing chambers(Fig. 3# 28 and 30, pages 14, bottom paragraph), each of them comprising a vessel to hold a workpiece in a processing solution and an anode electrode, wherein the workpiece functions as a cathode(Figs. 4-5, pages 17-20). Therefore, the wet chemical processing chambers as taught by Oberlitner in view of Mok meets the limitations of instant claim 7.

Regarding claim 8, Oberlitner further teaches another wet chemical processing chamber comprising a spin-rinse-dry chamber having a fluid delivery system that directs a cleaning fluid onto the workpiece as claimed(Fig. 2# 24, page 14, bottom paragraph).

Regarding claims 9-10, even though Oberlitner in view of Mok do not explicitly teach the claimed distances between the first and the second positioning elements as recited in claims 9-10, one of ordinary skill in the art would have found it obvious to have varied the positioning element spacing via routine optimization depending upon the precision of the positioning and alignment desired.

Regarding claim 11, Oberlitner further teaches that the paddle velocity can be controlled by controlling the motor that drives the paddle(page 30, Fig. 16). Therefore, the motor that controls the paddle reads on the claimed controller. The controller of Oberlitner in view of Mok is capable of moving the paddle relative to the workpiece support in a reciprocal manner along a linear axis with a stroke of the relative motive changing between two successive reciprocations as claimed.

Regarding claim 12, comparing Figs. 12-13 and 17 as taught by Oberlitner, it is clear that the paddle is positioned slightly higher than the bottom of the paddle assembly(i.e. base), therefore, is slightly closer to the processing site than the bottom of the paddle assembly. Therefore, the examiner asserts that the distance from the paddle to the processing site inherently taught by Oberlitner is at least 70% of the distance from the base of the paddle assembly to the processing site as claimed.

Regarding claim 14, Oberlitner further teaches the claimed magnet positioned proximate to the processing location as claimed(Figs. 4-5, # 34 & 38).

Regarding claim 15, Fig. 5 of Oberlitner shows the claimed electrode support. Since the electrode support is located below the processing location, the examiner asserts that the electrode support of Oberlitner in view of Mok is capable of moving relative to the vessel between a process position and a removed position along a motion path that does not pass through the process location as claimed.

Regarding claim 16, the recited limitation is directed to the shape of the paddle. Therefore, one of ordinary skill in the art would have found the claimed paddle having a first surface and a second surface in the claimed fashion an obvious design choice absent persuasive evidence that particularly claimed paddle configuration is significant. See MPEP 2144.04(IV). In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) .

Regarding claim 17, Oberlitner further teaches a plurality of fluid delivery ports located on the paddle for delivering electrolyte solution(Figs. 18-20, pages 27-29). Therefore, the paddle of Oberlitner in view of Mok is partially transmissive to processing fluid as claimed and is capable of resulting in relative motion between the paddle and the workpiece as claimed.

Regarding claim 19, Oberlitner further teaches the claimed thieving electrode (Figs. 25-27, pages 35-38).

Regarding claim 21, Oberlitner further teaches a lift and rotate assembly in the workpiece support to rotate the workpiece as claimed(Fig. 4, # 44, pages 18-19).

Regarding claim 22, Oberlitner further teaches that the size and the opening of the current thief can be adjusted for use with workpieces having a variety of sizes and shapes. Therefore, one of ordinary skill in the art would have found it obvious to have

varied shape and size of the current thief openings via routine optimization to produce the claimed first and second current values at the first and second circumferential sites of the process locations depending upon the variety of workpiece sizes and shapes.

5. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberlitner in view of Mok, and further in view of Goldberg US 4,937,998(Goldberg).

The teachings of Oberlitner in view of Mok are discussed in paragraph 4 above. However, Oberlitner in view of Mok do not explicitly teach the claimed plurality of joists between the rigid first panel and the rigid second panel.

Goldberg teaches a joist used as structure member providing inexpensive strength and rigidity support for flat surfaces such as flooring(col. 1 lines 32-35 and 48-55).

Regarding claim 4, it would have been obvious to one of ordinary skill in the art would have incorporated a plurality of joists as taught by Goldberg underneath the deck surface of Oberlitner in view of Mok in order to provide extra strength and rigidity as suggested by Goldberg to the deck surface for sufficient capability of bearing loads from plurality of processing stations carried by the deck surface of the mounting module.

Regarding claims 5-6, the deck surface of Oberlitner in view of Mok and Goldberg reads on the claimed upper panel and the plurality of joist as taught by Oberlitner in view of Mok and Goldberg read on the claimed braces. Even though Oberlitner in view of Mok and Goldberg do not explicitly teach the claimed lower panel under the braces, one of ordinary skill in the art would have found it obvious to have incorporated the claimed additional lower panel and attaching the deck surface(i.e. top

panel), the plurality of joists and the lower panel together in the deck of Oberlitner in view of Mok and Goldberg in order to provide sufficient top flooring and ceiling support surfaces for the joists as taught by Goldberg(col. 2 line 66 – col. 3 line 24).

In addition, the center bottom surface of the mounting module as taught by Oberlitner in view of Mok and Goldberg reads on the claimed platform.

6. Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberlitner in view of Mok, and further in view of Browne et al. US 6,955,747 (Browne).

The teachings of Oberlitner in view of Mok are discussed in paragraph 4 above. However, Oberlitner does not explicitly teach the claimed plurality of paddles as claimed.

Browne teaches that instead of using a single paddle, multiple paddles attached to a single cam can also be used for providing agitation with an electroplating cell (abstract, Fig. 3, col. 3 lines 32-35).

Regarding claim 13, it would have been obvious to one of ordinary skill in the art to have utilized multiple paddles as suggested by Browne in the wet chemical processing cell of Oberlitner in view of Mok for providing adequate an desired amount of agitation to the plating solution.

Regarding claim 18, Oberlitner in view of Mok and Browne teach the claimed first and second paddles. In addition, one of ordinary skill in the art would have found the claimed different shape and size limitations for the first and the second paddles an obvious design choice absent persuasive evidence that particularly claimed paddle

shape and size configurations are significant. See MPEP 2144.04(IV). In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oberlitner in view of Mok, and further in view of Woodruff et al. US 2001/0032788 A1 (Woodruff).

The teachings of Oberlitner in view of Mok are discussed in paragraph 4 above. However, Oberlitner in view of Mok do not teach the claimed plurality of electrode chambers as recited in claims 20 and 30.

Woodruff teaches an electroplating cell comprising a plurality of electrode chambers separated by dielectric walls, wherein each of the electrode chambers comprises one electrode(Fig. 4 # 530, 510(a-c), 520(a-d) and 600(a-d)).

Regarding claims 20 and 30, it would have been obvious to one of ordinary skill in the art to have incorporated the multiple electrode chambers as taught by Woodruff into the processing vessel of Oberlitner in view of Mok in order to allow adjustment of electrical field in the vicinity of workpiece depending on the particular needs of different workpiece as taught by Woodruff(paragraphs [0060] and [0062]).

Allowable Subject Matter

8. Claims 23-31 are allowed.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or fairly suggest, either alone or in combination, the claimed integrated wet chemical processing tool comprising the claimed mounting module, the claimed wet chemical processing station including a paddle chamber with a base portion having a second surface inclined to have a higher elevation toward a perimeter of the process location than toward a center of the process location, and the claimed workpiece transport system.

Response to Arguments

10. Applicant's arguments filed 25 July 2007 have been fully considered but they are not persuasive.

In the remarks, applicant argues that one of ordinary skill in the art would not have found it obvious to add the claimed positioning and attachment elements to the apparatus of Oberlitner since Oberlitner already teaches achieving "precise and reliable positional accuracy" with an encoder system.

The examiner does not find applicant's argument persuasive since the encoder system of Oberlitner and the alignment/holding mechanism of Mok(i.e. dowel pins and matching blind holes, and openings with matching nuts and bolts) are both techniques designed for accurate positioning, alignment and assembly of parts. Therefore, both systems are functionally equivalent. One of ordinary skill in the art would have found it obvious to combine the encoder system of Oberlitner and the alignment/holding mechanism of Mok for achieving the same purpose of accurately positioning parts for assembly of an apparatus. See MPEP 2144.06.

Applicant's additional arguments directing towards the amended feature of the paddle assemble is not convincing for the same reasons as stated in paragraph 4 above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Andricacos et al. US 5,312,532 teach using a paddle device having two parallel paddles of different shape that result in substantially the same agitation in an electroplating cell. Andricacos et al further teach that the motion of the paddles can be programmed(col. 8 lines 8-41).

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LLZ

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